

### REMARKS

Claims 18 - 42 remain pending in the present application. Claims 1 - 17 have been previously canceled. Claims 18, 23, 24, 27, 32, 36, 39, 41 and 42 have been amended. No new matter has been added. In view of the above amendments and the following remarks, it is respectfully submitted that all of the pending claims are allowable.

Claims 18, 36 and 39 stand rejected under 35 U.S.C. § 102(b) as anticipated by Lakin (U.S. Patent Application Publication No. 2003/0163202). 11/6/07 Office Action, p. 2.

Amended claim 18 recites a prosthesis for replacing a surface of a ball of a ball-and-socket joint comprising "a spherical shell section having an outer surface that is configured to lie in an articular fossa and for attachment to a surface, the shell section having a cavity for receiving a bone end" in combination with "a crown that partitions the cavity of the shell section into a first and second cavities adapted to receive the bone end, wherein the shell section comprises less than a hemisphere and a free edge of the crown lies in the same plane as a free edge of the shell section."

In contrast, Lakin discloses a femoral head resurfacing system comprising a head component extending over a hemisphere and including a connector on an inner surface thereof for connecting to a stem component. In addition, the cavity within the inner area of the connector does not receive a bone end, but instead receives a portion of the stem component. Specifically, Lakin describes a substantially hemispherical head component 12 including a substantially hemispherical outer articulating surface 16 and a substantially hemispherical inner bearing surface 18. *Lakin*, p. 2, ¶ [0032]. A connection member 20 extends outwardly from the inner surface 18 to cooperate with a complementary connection member 22 on the stem component 14. *Id.* at p. 2, ¶ [0033]. Although the connection member 20 partitions the inner area of the head component 12 into first and second cavities, only one of the two cavities is adapted to receive bone. Particularly, the cavity surrounding the connection member 20 receives bone, while a female morse taper 24 of the connection member 20, which forms the second cavity, receives a male morse taper 26 of the stem component 14. *Id.*; *see also* Fig. 1. Thus, it is respectfully submitted that Lakin does not show or suggest "a crown that partitions the cavity of the shell section into a first cavity and a second cavity, *the first and the second cavity adapted to receive the bone end,*" as recited in claim 18.

Therefore, it is respectfully submitted that claim 18 is not anticipated by Lakin and it is requested that this rejection be withdrawn.

Similarly, amended claim 36 recites a prosthesis for replacing a surface in a ball of a ball-and-socket joint comprising "a spherical shell section having an outer surface configured to lie in an articular fossa and for attachment to a surface, the shell section having a cavity for receiving a bone end" and "a crown that partitions the cavity of the shell section into a first cavity and a second cavity, the first and the second cavities being adapted to receive portions of the bone end, wherein the shell section comprises less than a hemisphere and a free edge of the crown is displaced from a plane in which a free edge of the shell section lies."

For the same reasons as described above in regard to the rejection of claim 18, it is respectfully submitted that claim 36 is not anticipated by Lakin and it is requested that this rejection be withdrawn. Because claim 39 depends from and includes all of the limitations of claim 36, it is respectfully submitted that this claim is also allowable.

Claims 36 - 38 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,332,036 to Sutter et al. ("Sutter"). 11/6/07 Office Action, p. 3.

It is respectfully submitted that Sutter does not show or suggest a shell section comprising "*less than a hemisphere*" as recited in claim 36 above. In contrast, Sutter specifically teaches a prosthesis 1 comprising a cap 3 whose outer surface 3a is formed in the shape of a calotte that is "larger than a hemisphere." *Sutter*, col. 3, ll. 15-19. Indeed, Sutter teaches securing the prosthesis 1 on the femur 11 by cutting an entire outer layer of head 11a off so that only a pivot 11d remains. *Id.* at col. 5, ll. 5-11; *see also* Fig. 4. That is, a full hemisphere is the minimum extent of the prosthesis 1 of Sutter and, it is respectfully submitted, therefore, that Sutter specifically teaches away from a shell section comprising less than a hemisphere. Furthermore, it is respectfully submitted that Sutter explicitly teaches away from the recited arrangement of "*less than a hemisphere*" in an attempt to increase the bonding between the prosthesis and the bone without regard to the difficulties imposed thereby. Specifically, it is submitted that applying the prosthesis over the bone more than a hemisphere requires the elimination of tuberosities and other features of the bone to which tendons and ligaments are connected interfering with the functioning of the joint. That is, as would be understood by those skilled in the art, the tuberosities and other bone features which would need to be eliminated to place the prosthesis of Sutter eliminate the binding areas for various ligaments and tendons negatively impacting the

functioning of the joint. Thus, it is important to recognize the binding features of the device according to the present invention and to understand the failure of the device of Sutter and other prior art devices to provide a mechanism for achieving sufficient binding between bone and prosthesis while eliminating the interference of the prosthesis with the connections between the tendons/ligaments and the joint.

Therefore, it is respectfully submitted that claim 36 is not anticipated by Sutter and that the rejection to this claim should be withdrawn. Because claims 37 and 38 depend from and include all of the limitations of claim 36, it is respectfully submitted that these claims are also allowable.

Claims 19 - 21, 35, 40 and 42 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Lakin. *11/6/07 Office Action*, p. 4.

As described above in regard to the § 102(b) rejection of claims 18 and 36, it is respectfully submitted that claims 18 and 36 are allowable. Because claims 19 - 21, 35 and 42 depend from and include all of the limitations of claim 18 and claim 40 depends from and includes all of the limitations of claim 36, it is respectfully submitted that these claims are also allowable and that the rejection to these claims should be withdrawn.

Claims 18, 22 - 31, 33, 34 and 41 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Sutter. *11/6/07 Office Action*, p. 6. The Examiner stated, in support of the rejection, that Sutter discloses the invention substantially as claimed, except for a free edge of the crown lying in the same plane as a free edge of the shell section. *Id.* The Examiner contends that limitations relating to size are not sufficient to patently distinguish over the prior art. *Id.*

It is respectfully submitted that the recitation of a spherical shell and a crown in which "*a free edge of the crown lies in the same plane as a free edge of the shell section*," as recited in claim 18 does not merely describe the size of the various components as the Examiner suggests. Rather, this limitation defines the relative size and locations of the recited features of the device - i.e., the structural qualities that determine the way in which the device will relate to the anatomy within which it is to be implanted. Specifically, the limitation indicates that the crown section is sized relative to the shell section so that the free edges of these components are coplanar. The absolute size of these components may be varied in any way so long as this geometric relation holds. For these reasons, it is respectfully submitted that the Examiner's dismissal of this

relationship renders this rejection an improper hindsight reconstruction as none of the cited references provides any motivation for the proposed modification. Furthermore, as noted above, the relative dimensions of the components of such a prosthesis impact in various ways the interaction of the prosthesis with the adjacent anatomy and are therefore, non-trivial as would be understood by those skilled in the art.

Furthermore, as described above in regard to the § 102(b) rejection of claim 36 as anticipated by Sutter, it is respectfully submitted that Sutter does not teach or suggest a spherical shell comprising less than a hemisphere,” as recited in claim 18. Thus, it is respectfully submitted that claim 18 is not rendered obvious by Sutter and that the rejection to this claim should be withdrawn. Because claims 22 - 31, 33 and 34 depend from and include all of the limitations of claim 18, it is respectfully submitted that these claims are also allowable.

Similarly, claim 41 recites a procedure for implantation of a prosthesis in a bone comprising the steps of preparing for implantation a “prosthesis including a spherical shell section and a crown, the shell section having an outer surface configured to lie in an articular fossa and for attachment to a surface, the shell section having a cavity for receiving a bone end, the crown partitioning the cavity of the shell section into a first cavity and a second cavity, wherein the shell section comprises less than a hemisphere and a free edge of the crown lies in the same plane as a free edge of the shell section” in combination with “inserting the prosthesis onto the bone such that the crown is received in the groove formed in the bone.”

For at least the same reason as discussed above in regard to the § 102(b) rejection of claim 36, it is respectfully submitted that claim 41 is not rendered obvious by Sutter. Specifically, Sutter does not teach or suggest providing a prosthesis including a spherical shell section “*comprising less than a hemisphere*,” as recited in claim 41. Thus it is respectfully submitted that claim 41 is allowable and that the rejection to this claim should be withdrawn.

Claim 32 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Sutter in view of Lakin. 11/6/07 Office Action, p. 9. The Examiner states that Sutter teaches the invention substantially as claimed, but does not teach a prosthesis wherein the crown and shell section are constructed to be threadedly coupled. *Id.* The Examiner cites Lakin to cure this deficiency. *Id.*

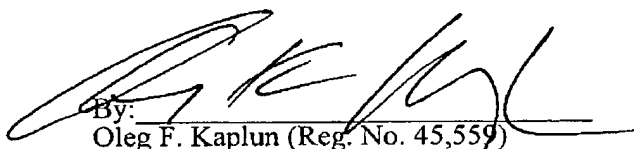
However, it is respectfully submitted that Lakin does not cure the deficiency of Sutter as described above in regard to the § 103(a) rejection of claim 18. Specifically, Lakin does not

show or suggest "a crown" wherein "*a free edge of the crown lies in the same plane as a free edge of the shell section,*" as recited in claim 18. Because claim 32 depends from and includes all of the limitations of claim 18, it is respectfully submitted that this claim is also allowable and that the rejection to this claim should be withdrawn.

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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